Quality Improvement of Fresh Food by Thermal Preprocessing

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Quality Improvement of Fresh Food by Thermal Preprocessing

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Heat treatments, such as use of aqua-gas (AQG), which is a mixture of micro-droplets of hot water in superheated steam (SHS), heating at 60℃ in water, and steaming are used mainly to inactivate enzymes that cause browning and to facilitate peeling of green fruit where the peel adheres firmly to the pulp, like in bananas. The characteristics of Cavendish banana (*Musa* spp.) blanched in AQG with SHS, boiling water, and steam were studied to determine the effectiveness of these treatments in prolonging the green stage of the fruit in order that the fruit could be prepared into value-added products. The work focused also on determining the characteristics of banana during the normal ripening process and on the effectiveness of these blanching techniques in delaying the ripening process. Untreated fruits stored at ambient conditions ripened after 8 days with a total soluble solids (TSS) content of 9%, which is the table ripe stage of bananas. Bananas to be used for preparing chips are required to have a maximum TSS of 5%. This level was attained in untreated bananas after 6 days of ripening. Blanching in water at 60℃ for 1, 3 and 5 minutes resulted in water soaked bananas after 5 days of blanching resulting in soft texture of the fruit. Steaming of green bananas for 30, 60 and 90 seconds resulted in ripened bananas after 4, 7 and 10 days, respectively. Blanching of mature, green bananas (Color Index, CI=2) with AQG delayed ripening time by about 7 days. Increase in TSS to 5% was attained after at least 14 days in bananas blanched for 60 seconds at 115℃ with AQG. Blanching for 90 seconds was also effective in prolonging the green stage of bananas, the 5% level was attained within 14 days of ripening or a delay of 7 days. Bananas blanched for 30 seconds delayed ripening by 4 days. Regression equations for ripening of bananas were obtained from the straight line in the graph representing the changes in total soluble solids content during its ripening. These equations can be used to predict the number of days before reaching the 5% TSS. Above results will be useful for producers of banana chips, flour and powder utilizing green bananas as raw material. The producers will have extended time to prepare these products and not worry about the early ripening of the raw material especially at times when there is abundant supply of green bananas.